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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/994,179	11/26/2001	Kazuaki Yazawa	9792909-0434	9468

26263 7590 06/17/2003

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EXAMINER	
CUEVAS, PEDRO J	
ART UNIT	PAPER NUMBER
2834	

DATE MAILED: 06/17/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/994,179	YAZAWA ET AL.	
	Examiner	Art Unit	
	Pedro J. Cuevas	2834	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-36 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-36 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 26 November 2001 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a)☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)
2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3)☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4)☐ Interview Summary (PTO-413) Paper No(s). _____ .
5)☐ Notice of Informal Patent Application (PTO-152)
6)☐ Other: .

DETAILED ACTION

Specification

1. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-5, 8-19, 21-23, and 30-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 3,609,991 to R. C. Chu et al. in view of U.S. Patent No. 4,392,062 to Bervig.

R. C. Chu et al. disclose the construction of a cooling system having thermally induced circulation having:

at least one fluid conduit (26, 30) configured to channel an electrically conductive fluid (28; column 4, lines 5-8) therethrough, thermally connected to at least one electrical component (14), and having a first column, a second column (46) oppositely positioned from the first column;

a volatile fluid (water, present in the fluorocarbon liquid mix) immersed in the fluid, which has a lower boiling point than the fluid, wherein the volatile fluid evaporates

due to the heat transferred to the fluid to create gas bubbles in the fluid to further increase fluid flow of the fluid; and

a heat exchanger (24) operatively positioned on the second column, and thermally connected to the second column to transfer heat out of the fluid across heat fins (48) into a heat reservoir (water chiller – not shown).

However, it fails to disclose at least one energy converter operatively associated with the at least one fluid conduit to generate electricity from the fluid flow, coupled to the at least one fluid conduit downstream from the electrical component, and comprising a first electrode, a second electrode and a permanent magnet centrally displaced therebetween.

Bervig teach the construction of a fluid dynamic energy producing device having at least one energy converter (19) operatively associated with at least one fluid conduit (18) to generate electricity (generator 21) from the fluid flow, for the purpose of producing electrical energy by the circulation of a fluid in a dynamic circulation system.

It would have been obvious to one skilled in the art at the time the invention was made to use the fluid dynamic energy producing device disclosed by Bervig on the cooling system having thermally induced circulation disclosed by R. C. Chu et al. for the purpose of producing electrical energy by the circulation of a fluid in a dynamic circulation system.

4. With regards to claims 4 and 21, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use a liquid metal as the heat transporting liquid, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. In re Leshin, 125 USPQ 416.

5. With regards to claims 8, 11, 18, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use the cooling system on electrical component's capable of generating heat at less than or equal to 150 °C, and gas bubbles have diameters less than half a smallest diameter of the fluid conduit, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

6. With regards to claims 30-36, it would have been obvious to one having ordinary skill in the art at the time the invention was made to develop a method of dissipating waste heat comprising the steps of:

channeling an fluid through a fluid conduit;

differentiating the density of the fluid by thermally connecting the fluid conduit to a electrical component generating heat causing the fluid to flow by convection through the fluid conduit;

dissipating heat from the fluid for maintaining the differential of the density;

transferring the energy to an electrical storage;

generating energy by directing the fluid through an energy converter; and

increasing the flow by immersing a volatile fluid in the fluid;

to appropriately use the claimed invention in order to obtain consistent and reliable heat removing results.

7. Claims 6, 7, 20, and 24-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 3,609,991 to R. C. Chu et al. in view of U.S. Patent No. 4,392,062 to

Bervig as applied to claims 1-5, 8-19, 21-23, and 30-36 above, and further in view of U.S. Patent No. 5,441,102 to Burward-Hoy.

R. C. Chu et al. in view of Bervig disclose the construction of cooling system as described above, and a plurality of electrical leads transferring the electricity to an electrical storage.

However, it fails to disclose a first and second electrodes; and

a permanent magnet, the permanent magnet configured to create a magnetic field across the fluid whereby an electric potential is raised between the first electrode and the second electrode.

Burward-Hoy teach the construction of a heat exchanger for electronic equipment having a heat transfer apparatus (100) including:

a first and second electrodes (connecting the magnetic coil assembly 102);

a permanent magnet (column 3, lines 50-55), the permanent magnet configured to create a magnetic field across the fluid whereby an electric potential is raised between the first electrode and the second electrode for the purpose of causing the agitation of the heat transfer liquid in the heat pipe 103; and

a plurality of electrical leads coupled to the first electrode and the second electrode.

It would have been obvious to one skilled in the art at the time the invention was made to use the electrodes and permanent magnets disclosed by Burward-Hoy on the generator of the cooling system disclosed by R. C. Chu et al. in view of Bervig for the purpose of having a permanent magnet generator producing the electric energy.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. See PTO-892.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Pedro J. Cuevas whose telephone number is (703) 308-4904. The examiner can normally be reached on M-F from 8:30 - 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nestor R. Ramírez can be reached on (703) 308-1371. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305-1341 for regular communications and (703) 305-3432 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Pedro J. Cuevas
June 11, 2003